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(12) **Patent:** (11) **CA 714822**

(54) RAILWAY CAR TRUCK

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ABSTRACT:

CLAIMS:

*** Note: Data on abstracts and claims is shown in the official language in which it was submitted.

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(74) Agent:	
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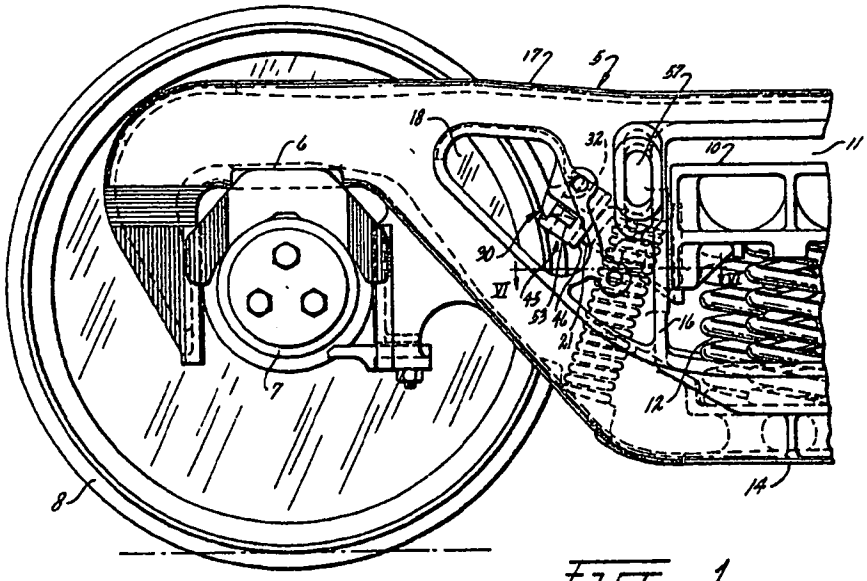

Fig-1

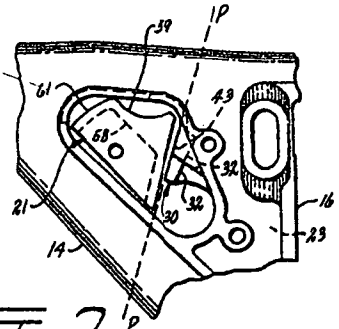

Fig-2

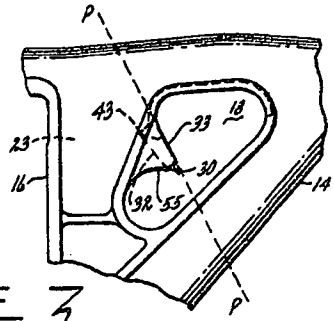

Fig-3

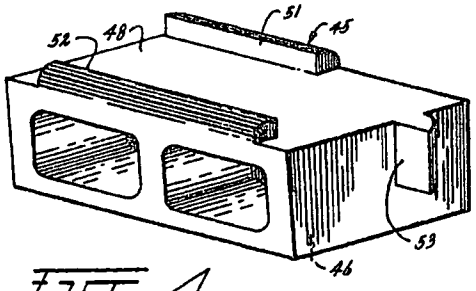

Fig-4

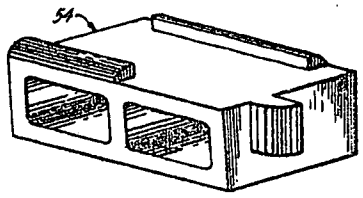

Fig-5

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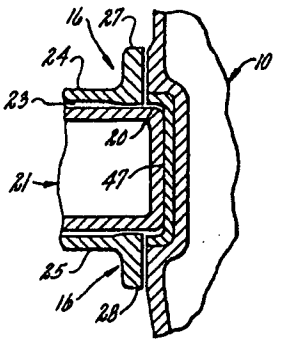

Fig-6

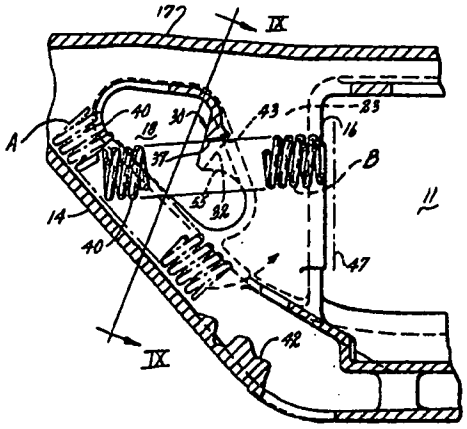

Fig-8

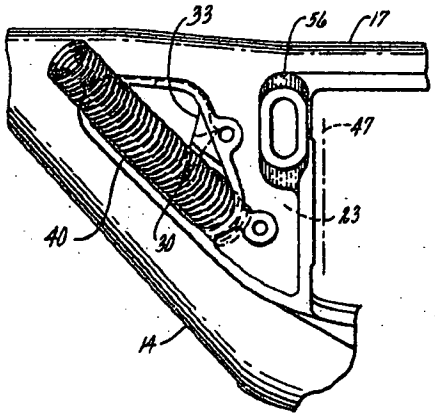

Fig-7

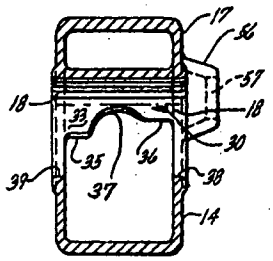

Fig-9

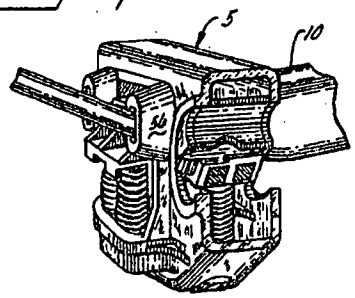

Fig-10

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The present invention relates to railway car trucks which include friction systems for dampening the vertical oscillation of bolsters relative to side frames thereof. The invention is concerned particularly with a type of car truck having recent origin in the art wherein a friction wedge is supported within a side frame against a bolster by a chock which is readily removable from its operative position in the frame during a minor retraction of the wedge from its position against the chock in the bolster.

The conventional side frame comprises a pair of horizontally spaced columns, a compression member extending across and merging with the top ends of the columns, and a tension member crossing and merging with the bottom ends of the columns and extending in opposite longitudinal directions beyond and upwardly to merge with end portions of the compression member. In addition to the bolster opening thus formed between the columns, one column, the tension member and the compression member form a pair of transversely spaced windows between the bolster opening and each end of the frame.

In the construction of side frames approved by the Association of American Railroads as standard for use in North America, the windows are larger, for example, on the smaller, so-called 5½ x 10 side frame for 50-ton cars than on the larger 6 x 11 or 6½ x 12 side frames for 70-ton and 90-ton cars, respectively. These numbers designate in inches the size of the axle journal on which the side frame is used.

*

The aforementioned earlier invention embodying the removable friction-wedge supporting chock was made with respect to the smaller of the aforementioned frames which have large enough windows to receive all parts of the bolster-snubbing system housed by the frame. The wedge-supporting chock is correlated with the other portions of the friction system for substantially instant removability from the frame through the adjacent windows without other disassembly of a car truck. When this is effected, the other portions of the friction system are also removable in the same manner.

The present invention originated in the discovery that the larger types of side frames could not use a chock and support of the design permitted by the larger windows of the smaller capacity side frames.

Hence, the general object is to provide railway car truck design by which car trucks of different capacities may incorporate the bolster-snubbing mechanism including the removable chock herein disclosed.

It is also an important object to provide side frame design applicable in accordance with the foregoing object in which the structure of a tension member, a chock, the friction wedge and a spring for the friction wedge are so related as to permit passage of the spring through the frame window to a position between the wedge and a seat for the spring, when the chock is removed.

Broadly speaking, the invention resides primarily in the side frame and friction mechanism of a railway truck of the type utilizing the wedge-supporting chock wherein the support therefor and the chock are especially constructed to permit removal of the various components of the bolster-

snubbing mechanism through the frame window in frames of various window sizes and capacities. The side frame of such a railway truck comprises, as an environment for the invention, a column, a tension member, and a compression member all defined in part by spaced side walls of the frame. The frame has a bolster opening in one side of the column and a pair of transversely-spaced windows on the other side thereof with one window in each wall. The walls laterally enclose a wedge-receiving region extending between the bolster opening and the windows. As the present truck utilizes a chock, the frame further includes a support fixedly mounted between the walls in a vertically remote part of the frame. In a preferred embodiment, the support is secured in an upper part and extends into the space between the windows to present a work surface facing through the wedge-receiving region in a direction toward said bolster opening. This direction is oblique with respect to the column. The frame has a spring seat disposed in a vertically remote part of the frame in spaced vertically opposite relation with that in which the support is fixed. The frame is thus adapted to support a removable chock against the work surface of the support, a friction wedge between the chock and a bolster received in the opening, and a spring standing in a state of compression between the seat and a surface of the wedge facing the seat.

The improvement in accordance with this invention resides essentially in the termination of the support between adjacent windows in two corner portions. One corner portion has greater clearance with the window-defining member of the frame, in substantially opposed

relation therewith, e.g., the tension member, to enable passage of the friction wedge spring between the support and such member inwardly of the frame to the wedge-receiving region. The invention further entails conformance of those portions of the chock which fix its position relative to the support during operation of the modified structure of the support.

In a preferred embodiment, the support is located relative to the adjacent windows so that its surface which faces away from the bolster opening is correlated with the size and shape of the wedge, and that portion of an adjacent window disposed in a direction away from the bolster opening beyond the plane of such surface of the support to permit passage of the wedge through the window into an interior region of the frame enabling transfer of the wedge to its operative position.

In the drawing with respect to which the invention is described below:

Fig. 1 is a fragmentary elevation of an assembled truck.

Fig. 2 is a fragmentary lateral elevation of a window-forming portion of a side frame as viewed from one side with a wedge shown in the window in a position for passing therethrough.

Fig. 3 is a fragmentary lateral elevation of the window-forming portion of the side frame of Fig. 2 as viewed from its other side.

Fig. 4 is a perspective view of a chock adapted for use with a chock support as illustrated in Figs. 1 to 3.

Fig. 5 is a perspective view of a chock of which its construction is in mirror image of the chock in Fig. 4 and required in addition thereto when the snubbing mechanism includes wedges at both sides of the bolster.

Fig. 6 is a fragmentary view on horizontal cross-section of a side frame, friction wedge, and bolster taken along line VI-VI of Fig. 1.

Fig. 7 is a fragmentary lateral elevation of the side frame illustrating the passage of the friction wedge spring through the window between a corner portion of the chock support and the tension member.

Fig. 8 is a view of a frame similar to that of Fig. 7 illustrating later stages in the passage of the friction wedge spring to operative position.

Fig. 9 is a cross-section of the frame taken along line IX-IX of Fig. 8 with the wedge spring removed for direct viewing of the chock support.

Fig. 10 is a fragmentary perspective view of a frame and bolster assembly illustrating the manner of removing the chock of Fig. 4.

Fig. 1 illustrates one-half of a car truck including a pedestal type side frame typical in design of the 6 x 11 size for use in 70-ton cars. This side frame is similar in general outline with other heavy duty side frames in railway use except for the features relating to this invention. In the arrangement shown, the side frame 5 rests on an adapter 6 which in turn is supported on the outer case or housing of the roller bearing assembly 7 mounted on the axle for the wheel 8. The side frame provides resilient support for a bolster 10 within the

bolster opening 11 of the frame through a plurality of springs 12 seated on a spring seat within the tension member 14 defining the floor of the frame within the bolster opening. As commonly found in the art, the frame comprises a pair of horizontally spaced columns 16 (one column not shown), a compression member 17 extending lengthwise of the frame across and merging with both upper ends of the columns. The tension member 14 extends across and merges with both lower ends of the columns and then projects lengthwise beyond each column in a diagonal section that meets with and merges with the compression member 17 at opposite ends of the frame. As a consequence, all four members form the bolster opening 11 at one side of each column centrally of the frame, and a window (see window 18) at the other side of each column.

In view of the practice of maintaining some of the overall dimensions of the truck substantially constant in providing trucks of higher capacity, the windows tend to become smaller as the capacity increases. For example, the smaller, extensively used 5½ x 10 side frame would not necessarily involve the use of the present invention.

The embodiment of the invention herein illustrated shows the bolster 10 indented on opposite sides by recesses (see recess 20) within which a pair of friction wedges (see friction wedge 21) are received when supported as hereinafter described. In the arrangement shown, the bolster 10 is readily removed from the side frame by an endwise movement of the bolster at any elevation within the bolster opening after removal of the springs 12 and the wedges 21. Each wedge is received within a wedge-

receiving region 23 extending from the bolster opening 11 to the windows 18. The region 23 is defined in a lateral sense by transversely spaced walls 24 and 25 which in part form the column 16 as well as the tension member 14 and the compression member 17. The region 23 also receives a chock and wedge spring described hereinbelow. Each column further comprises flanges 27 and 28 merging with walls 24 and 25, respectively.

Considering now the improvement to which the present invention is directed, the side frame includes a chock support 30 extending in a transverse direction of the frame between the walls 24 and 25. As shown, the support 30 is disposed in an upper part of the frame and projects downwardly into a space between an opposed pair of windows 18. The support 30 has a chock-receiving face 32 facing in a downward oblique direction toward a bolster opening 11. The support 30 has an oppositely-facing surface 33 contoured approximately within a plane P-P.

The chock support terminates along its lower edge or extremity in a pair of corner portions 35 and 36 connected by an arcuate concave surface 37 (see Fig. 9). Each corner portion is adjacent one of the pair of opposed windows 18. The corner portion 36 has greater clearance with the tension member 14 along the edge portion 38 than does corner portion 35 with respect to the edge portion 39 of the tension member.

The clearance between corner portion 36 and the tension member is at least slightly greater than the outer diameter of a friction wedge spring 40 to permit passage thereof into the frame in the manner shown by Fig. 7 to the

positions within the friction member shown by Fig. 8. Friction wedge springs such as the spring 40, and as contemplated in the practice of this invention, have an outside diameter of at least about 40 per cent of the distance between the walls 24 and 25. Because of the considerable length required to provide such compressive deformation as to allow removal of the chocks, and the corresponding gages in overall diameter and wire diameter thus entailed, the outside diameter of the springs will, in accordance with present spring technology, be within a range of 40 to 55 per cent of the distance between the side walls. For example, if the distance between walls 24 and 25 is 7-1/4 inches, the outer diameter of the spring will be in an approximate range of 3-1/4 to 3-1/2 inches.

From a position A within the tension member 14 in which the spring is aligned lengthwise in a vertical longitudinal plane of the frame and properly oriented for passing under the support through a substantially inverting motion in which it passes through position B placing one end of the spring on a spring seat 42. The innermost limit of the wedge-receiving space in which the spring 40 is maneuvered into place is the bottom surface 47 of the recess 20 shown in dot-dash lines in Figs. 7 and 8. Because of the proximity of the support to the column 16, the lower end of the spring at position A of Fig. 8 must pass upwardly in a partial rotative movement of the spring to become the upper end at operative position, as shown in Fig. 1. The distance between the support and the seat 42 is shorter than the length of the spring and prevents the

upper end of the spring in position A becoming the upper end at the position of Fig. 1. The transfer of the spring from position A to the operative position of Fig. 1 is facilitated by the concave arcuate surface 37 of the manner made apparent by Fig. 8.

The distance between the upper extremity 43 of the support surface 32 (see Fig. 8) and the bolster surface 47 (see Fig. 6) is at least as great as the maximum dimension of the wedge taken longitudinally of the side frame (see Fig. 1). This is the maximum dimension between its relatively angled friction surfaces. This condition permits lifting of the wedge upwardly between the extremity 43 and the bolster surface 47 to a position above the support 30 to allow introduction of the spring to an upright position on its seat 42.

Of basic importance to this invention is the structure of a chock, such as that of chock 45 illustrated separately in Fig. 4, especially the features thereof that adopt it for cooperation with the specially constructed support 30. The support and the chock cooperate in establishing a pocket for the wedge 21 between the face 46 of the chock on one side and on the other side by a surface 47 at the bottom of the recess 20 of the bolster 10. The chock has another surface 48 generally complementary to the surface 32 of the support 30. Surfaces 48 and 32 engage in preferably planar contact in the assembled condition of the car truck as shown in Fig. 1.

At the upper limit of the surface 48, the chock has a flange 52 projecting outwardly from the plane of surface 48 thereby enabling this flange to extend past

the upper extremity of the surface 32. The flange 52 is shorter than the length of the chock to accommodate internal fillets which join the support to the walls 24 and 25. The chock also has a lower flange 51 projecting in Fig. 1 past the lower extremity of the surface 32.

As the lower corner portions of the support terminate at different elevations, the flange 51 cooperates with the more downward corner portion of the support. The chock has another flange or lug 53 cooperating with the support corner portion 36 and particularly a vertical side web 55 of the support extending from its surface 32 toward and merging with a portion of the wall 25 forming the column 16. The flanges 51, 52, and 53 thus cooperate with the upper and lower extremity of the support 30 to prevent sliding of the chock along the support 32.

As the friction mechanismsat both sides of the bolster are removed through windows along the side frame facing outwardly of the railway car, the chocks for the two different mechanisms of a frame are provided in "rights" and "lefts". Fig. 5 illustrates a chock 54 constructed as a "mirror image" replica of the chock of Fig. 4.

Assuming the car truck to be assembled except for the friction mechanism and with all parts thereof removed, the steps in assembling the mechanism may be performed as follows:

(1) to pass the friction wedge 21 through the window and into the wedge-receiving region 23; the wedge may be retained, preferably above the support 30, in the upper part of this region by a pin passed thereunder through an aperture 57 of a pry-bar receiving boss 56;

(2) The spring 40 is passed as hereinbefore described into the frame and into an upright position wherein it rests on the seat 42.

(3) The wedge 21 is then lowered into telescoping relation with the upper end portion of the spring to obtain engagement of its upper end with the seating surface 58 of the wedge.

(4) A pry-bar is then inserted through the aperture 57 of the boss 56 into contact with the top surface 59 of the wedge. A jack or several men then lift the outboard portion of the bar to force the wedge downwardly with the accompanying compressive deformation of the spring.

(5) At this stage, the friction surface 61 of the wedge is separated sufficiently from the surface 32 of the support 30 to enable the chock to be inserted into the frame and into position between the wedge and the support with its surface 48 engaging surface 42 and the upper and lower flanges thereof projecting passed the upper and lower extremities of the surface 32.

(6) The pry-bar is thereupon released to allow the wedge 21 to move up into a position between the chock and the bolster, as shown in Fig. 1. To disassemble the mechanism, this procedure is reversed.

The terms and expressions which have been employed are used as terms of description and not of limitation and there is no intention of excluding such equivalents of the invention described or of the portions thereof as fall within the scope of the claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A side frame for a railway truck comprising:

a. transversely spaced side walls,

b. a column member,

c. a tension member, and

d. a compression member, said members all defined in part by the side walls; the frame having

e. a bolster opening on one side of the column, and

f. a pair of transversely spaced windows on the other side of the column in said walls; said walls laterally enclosing a wedge-receiving region extending between the bolster opening and the windows;

g. a support fixedly mounted between said walls and extending into a space between said windows; said support having

(1) a work surface facing through said region in a direction toward said bolster opening in oblique relation with the column;

h. a spring seat fixed in a vertically remote part of the frame in vertically spaced relation with the support;

said frame normally supporting a removable chock against said work surface, a friction wedge between the chock and a bolster received in said opening, and a spring standing in a state of compression between said seat and a surface of the wedge facing the seat;

said support terminating toward said seat in corner portions, one adjacent each window and one of said corner portions having a greater clearance with the adjacent one of said members than the other to enable lengthwise passage of the spring between said one corner portion and said member into said wedge-receiving region.

2. The side frame of claim 1 wherein: said clearance of said one corner portion with said adjacent one of said members is at least 40 per cent of the spacing of said walls at said wedge-receiving region.

3. A side frame comprising:

a. transversely spaced side walls,

b. a column,

c. a tension member,

d. and a compression member, said members all defined in part by the side walls, the frame having a

e. bolster opening on one side of the column and a pair of transversely spaced windows on the other side of the column, one window in each of said walls; said walls laterally enclosing a wedge-receiving region extending between the bolster opening and the windows; the lower sides of the windows being defined by said tension member;

f. a support fixedly mounted in the upper part of the frame and extending downwardly into a space between said windows; said support having

(1) a work surface facing through said region in an obliquely downward direction toward said bolster opening;

g. a spring seat spaced in the lower part of the frame in subterposed spaced relation with the support;

said frame normally supporting a removable chock against said work surface, a friction wedge between the chock and the bolster received in said opening, and a spring standing in a state of compression between said seat and a surface of the wedge facing the seat;

said support terminating downwardly in corner portions, one adjacent each window; one corner portion

having a greater clearance with the tension member than the other to enable lengthwise passage of the spring between said one corner portion and the tension member into said wedge-receiving region.

4. The side frame of claim 3 wherein: said greater clearance is at least 40 per cent of the spacing of said walls.

5. The side frame of claim 2 wherein: said corner portions are of unequal elevation and are connected by a concavely-arcuate lower edge surface adapted to receive the periphery of a friction wedge spring for said truck to facilitate passage of the spring from a position disposing its length lengthwise of and within said tension member around and under said support intc vertical position with said wedge-receiving region without substantially entering said bolster opening.

6. In a railway truck:

a. a side frame comprising

(1) transversely spaced side walls,

(2) a column member,

(3) a tension member, and

(4) a compression member, said members all defined in part by said walls; said frame having

(5) a bolster opening on one side of the column and

(6) a pair of transversely spaced windows on the other side of the column and defined by said walls; said walls laterally enclosing a wedge-receiving region extending between the bolster opening and the windows; the lower sides of the windows being defined by said tension member;

b. a support fixedly mounted in the upper part of the frame and extending downwardly into a space between said windows; said support having

a work surface facing through said region in an oblique downward direction toward said bolster opening and terminating downwardly in lower corner portions, one adjacent each window;

one corner portion having a clearance with the tension member that is at least 40 per cent of the spacing between said walls and greater than the clearance between the other lower corner portion and the tension member;

c. a chock seated against said work surface, and when positioned thereagainst, having upper and lower flange means extending away from said bolster opening in overlapping relation and closely engageable relation with upper and lower extremities of the support;

d. a spring seat disposed in the lower part of the frame in subterposed spaced relation with the support;

e. a spring; and

f. a bolster extending through the bolster opening;

said frame supporting an upwardly-pointing friction wedge in wedging relation with the bolster received in said opening and said chock seated on said support, and said spring standing in a state of compression between said seat and a surface of the wedge facing the seat.

7. The railway truck of claim 6 wherein: said one lower corner portion comprises a web at the lateral extremity of the support having an undersurface extending parallel to said oblique direction;

said flange means comprises an upper flange extending opposite to said oblique direction from the upper extremity of said work surface, a lower flange extending underneath

said other corner portion opposite said oblique direction, and a flange extending in a lateral direction underneath said web.

8. In a railway truck:

a. a side frame;

b. a chock;

c. a friction wedge having relatively angled friction surfaces;

d. and a friction wedge spring; said frame comprising:

(1) a pair of transversely spaced side walls,

(2) a column member,

(3) a tension member,

(4) a compression member, all said members defined in part by the side walls; said frame having

(5) a bolster opening on one side of the column, and

(6) a pair of windows on the other side of the column of which their lower sides are defined by said tension member,

(7) a support fixedly mounted in the upper part of the frame and extending downwardly into a space between said windows,

(8) a spring seat in the lower part of the frame in subterposed relation with the support;

said walls laterally enclosing a wedge-receiving region extending from the bolster opening between said support and said seat to said windows, said support having

(i) a work surface facing in an oblique downward direction through said wedge-receiving region toward the bolster opening,

(d) a reverse side surface facing opposite to said oblique direction, and terminating downwardly in two lower corner portions, each corner portion adjacent to one of said windows; the spacing of one corner portion being greater, and the spacing of the other corner portion being lesser, with respect to the tension member than the outer diameter of the spring;

said chock having flange means in overlapping and close engageable relation with an upper portion and said lower corner portions of the support when said chock is seated in working position on said work surface; and

e. a bolster extending through said bolster opening;

in working position, said wedge being disposed with said surfaces thereof in wedging relation with a surface of the chock facing away from the support and said bolster, said spring being disposed in a condition of compression between a seat therefor on said wedge and said spring seat;

said support being spaced from the extremity furthest from said column of one of said windows for passage of the wedge through that portion of said window between the plane of said reverse side surface and its respective extremity.

9. The railway truck of claim 8 wherein:
the spacing of the support relative to the bolster opening is greater than the maximum distance between said angled surfaces of the wedge and sufficient to allow movement of the wedge upwardly between the support and a bolster in said opening to a position above the support.

10. The railway truck of claim 8 wherein: said diameter of the spring is at least 40 per cent of the distance between said side walls within said wedge-receiving region.

11. A chock for supporting a friction wedge in position against a bolster and a side frame having oppositely facing generally parallel surfaces of which one is adapted to engage a friction wedge and the other is adapted for face-to-face engagement with a support therefor in the frame, flange means extending outwardly from the plane of said other surface for overlapping said support, and flange means extending in a direction parallel to said plane for engaging downward-facing lateral wall structure of the side frame.

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